Gas Journal

VOL. 299 111th YEAR LONDON, SEPTEMBER 23, 1959 No 5012 PRICE 1/6

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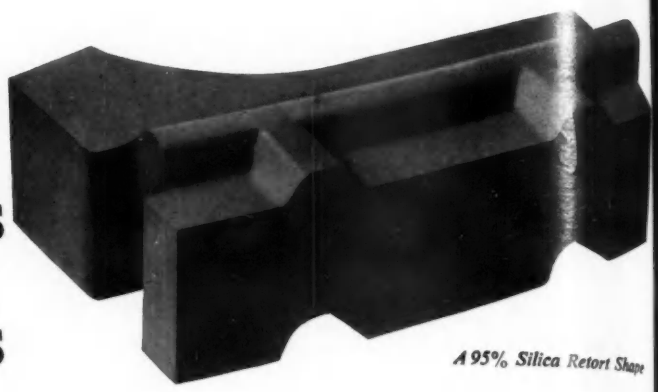

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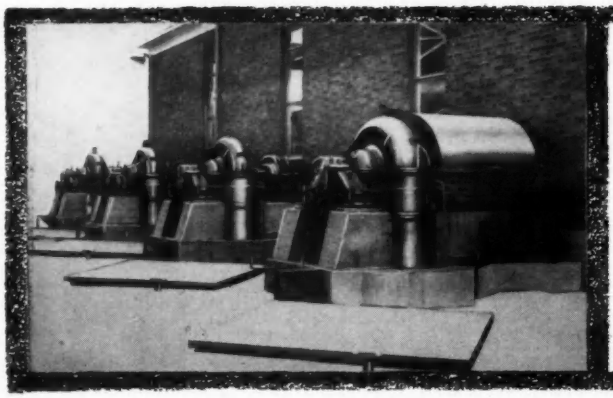

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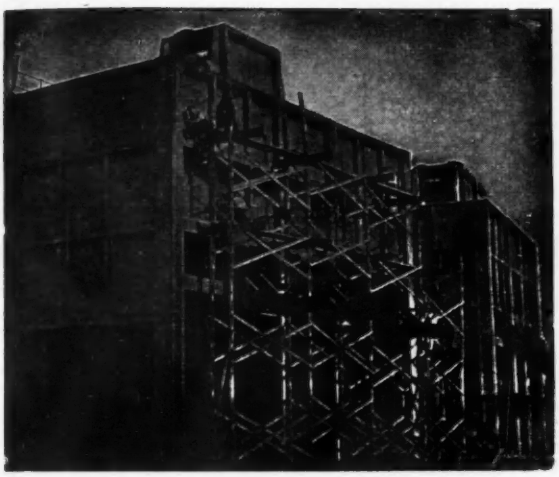

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Gas Journal

VOL. 299 *No. 5012* *September 23, 1959*

IIITH YEAR

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Publishers' Notice, See Page 306, September 16, 1959

PHOTO: HOUSTON ROGERS

Nadia Nerina, prima ballerina of the Royal Ballet, Giselle. Act 2.

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Gas Journal

VOLUME 299 No. 5012 SEPTEMBER 23, 1959 111th YEAR

Set Fair for 2000 A.D.?

THERE appears to be evolving a specific technique practised by men of eminence, in industry or elsewhere, when chosen to deliver memorial lectures. The technique consists of telling their hearers of the most recent advances in their particular field while at the same time, by linking the present with the past, sketching in the background in such a way that the future becomes clearer and a better balance is preserved between it and the present. Such, we felt, was the case when Sir Henry Jones, Chairman designate of the Gas Council, delivered the William Young Memorial Lecture at the Autumn meeting of the Scottish Association of Gas Managers at Largs recently.

Although we hope to publish the lecture, which Sir Henry has called ' Towards 2000 A.D.,' next week, there is so much that he said to give those working in the industry both food for thought and confidence in the future, that we feel that we would do well to call attention to a few of the many points he made.

After outlining William Young's career, Sir Henry compares his outlook and the conditions ruling in Great Britain in 1851 with the present day. This is particularly interesting, and we cannot help feeling that in spite of the much vaunted scientific methods of today, development in the gas industry, except for the last few years, has lost some of its momentum since Young's death in 1907.

The development of oil gasification since the war is well known, but as Sir Henry points out, William Young had already successfully experimented with ways of making town gas from oil in the 1890's or earlier.

As Mr. E. G. Smith said when moving a vote of thanks to Sir Henry for his lecture, it was a salutary thought that William Young viewed the gas industry on the broad basis of chemical engineering, and today they were turning in full circle from what had become traditional methods of carbonisation back to the pattern which Young practised and wherein the cheaper therm was likely to be realised. The economic climate is clearly a most active agent in encouraging new processes. When the price of the industry's raw material has more than doubled in ten years, other means of gas-making must be sought; such a stimulus only became a reality after 1939.

The rise in population from 18 mill. in England and Wales and 3 mill. in Scotland in 1851 to 44 mill. and 5 mill. respectively in 1950, gives some indication of how the potential demand for fuel must have changed. But it will not merely be a matter of numbers of people wanting to keep themselves warm—it will depend on the age group, the income group, and the minimum standards of comfort thought essential.

As Sir Henry points out, when the consumption of gas per domestic consumer dropped some 30 years ago, it was put down to a change in the habits of the population, due notably to the popularity of the cinema and dining out. Today the family car takes the household out, but the television brings them back. How then can the gas industry take full advantage of the tendency for all but the teenagers to spend more time at home? The answer Sir Henry gives is cheaper, cleaner, non-toxic, sulphur-free gas.

A gas with most of these properties can probably be obtained by carbonisation but it is unlikely to satisfy the first condition, that of being cheap, since it will have to undergo further processes of purification, all of which will add to its cost of production. What of the new gas-making processes now being investigated, many of which are showing distinct promise of succesful commercial exploitation?

Several means for the complete gasification of cheaper coals are actually in commercial use, notably the Gas Integrale and Power Gas processes, of which there are plants at Kensal Green and Watford respectively. There is, however, a serious drawback to all such processes. It is that the calorific value of the gas made is below the declared value of any gas distributed by any area board. Some means of enrichment must be employed, generally oil or rich coal gas from an adjacent carbonising plant. Even gas from the Lurgi plant at Westfield in Fife will need an independent hydrocarbon source for gas enrichment. This is a point which we were most pleased to

see raised and stressed by Sir Henry, since it is sometimes forgotten in the very justified enthusiasm over progress being made at the present time.

Reference was also made, however, to the full-scale experiments on oil hydrogenation, to be followed later on by coal hydrogenation, at the new plant being built at Partington, near Manchester. Such a plant may well make a gas of much higher calorific value than is commonly distributed as town gas in this country. Naturally if such a gas could be distributed without reforming or dilution, the thermal carrying power of all existing grid systems would increase with a lowering of distribution costs per therm of gas carried. The expense and the work of adjusting all consumers' appliances would, Sir Henry thinks, be commercially justified.

There are two further points in the lecture which we think are of great significance. These are the very distinct possibility of a national grid coming into being in the foreseeable future and the demand for a clean, refined fuel acceptable to the average housewife wanting the most convenient form of space heating.

We have often referred to the possibility of gas made at the colliery being fed into a national gas grid. Now Sir Henry adds to this ideal state of affairs the words 'or at the port'; so he clearly visualises the possibility of imported natural gas or large-scale oil gasification plants into which the oil would be taken by pipe-line from the nearby refinery or even from the tanker itself. Such a gas, as well as being clean, non-toxic and sulphur-free, should, with no inland freight charges to pay, be cheap as well, and fully capable of being able to compete with solid fuel, smokeless or otherwise, and if all factors are taken into account, with oil and electricity too. Good, efficient and inexpensive appliances which are now becoming almost a commonplace, should complete the 'case for gas.'

The Achievement at Cwm

THE placing of coke oven plants among the South Wales mining valleys has always taxed the design engineers' ingenuity. In a region geographically small for the scope and importance of the basic industries it carries, it has always been necessary to tuck away the plants in narrow valleys and give them an unfamiliar elongated appearance. That was, of course, pre-war, before the advent of large earth-moving equipment capable of changing the face of the countryside with comparatively little human effort.

The building of the new coke oven plant at Cwm in Glamorgan, which we describe in our current issue, is an example of how a modern plant can be brought to a colliery situated in a somewhat remote, almost unknown, minor valley and yet be laid out according to modern notions of mechanical handling, heat conservation, by-product manufacture and enlightened working conditions, on an artificially formed site.

Developments at existing coke oven plants were mostly impossible, since the lie of the land made additions difficult and even the partial dismantling of the carbonising plants, followed by complete rebuilding in timed phases, would have involved the complete renewal of ancillary plant, the great proportion of which was completely obsolete.

The South Western Division of the National Coal Board began by building a new plant at Nantgarw. This plant is on a large, naturally flat site at a point where the main Taff valley debouches in flatter country and may be looked upon as the confluence of the railways bringing coal out of this particular section of the mining valleys. It is therefore strategically placed for selecting suitable coal blends as well as offering a suitable layout for modern plant.

This could not be said of the Cwm plant which is in a shallow, narrow valley about 400 ft. above sea level and devoid of suitable water supplies, but within easy belt conveyor distance of suitable coal for foundry coke manufacture.

South Wales coal can be blended for the successful manufacture of foundry coke which is sent to foundries in the Midlands and even as far afield as Dundee. This market has been developed over the years and increasing care has been given to improving coke quality by better methods of coal preparation, as well as increased coking times to ensure a coke of suitable physical structure.

The plant at Cwm has been laid out with the foundry coke market in view and combines the manufacture of the two famous grades made before nationalisation, Min Sep and Crown Foundry. The preparation of the coal for the former is most important and a Chance washery, including special mineral separation type of washing equipment, has been installed at the adjacent colliery and supplies fine slack coal of 4% to 5% ash content to the new coke ovens. The resulting coke is of exceedingly fine texture and high shatter test.

Of the plant itself, much of it is completely orthodox, though the longer carbonising times needed in foundry coke manufacture demand certain modifications in the day-to-day management of the batteries.

The sulphate plant is of the direct intermittent type, using unsaturated solutions of ammonium sulphate, vacuum evaporators for crystallisation, continuous centrifuges and a steam heated dryer. The salt turned out is of Grade 1 quality, a most distinct step forward compared to other, older plants lately in use in this division. The treatment of the effluent from the plant is unique and owes the success of the biological methods employed to the work of Mr. D. E. Cunningworth at the N.C.B. research laboratory at Ystrad Mynach. This process has made possible the destruction of phenols and thiocyanate contained in the liquor and allows it to enter the local streams without harmful effect.

A special achievement in the building of this plant has been the provision of a suitable water supply. This has been done by bringing water from three collieries, one of which is at least three miles away and 200 ft. below. Water from the two nearer collieries is brought underground and pumped up to reservoirs at the Cwm colliery and coke works.

We feel that these developments are in the tradition of the South Wales coalfield in that the difficulties involved have always been stupendous but never have they remained unsolved.

Personal

MR. P. RUSHWORTH, Director and Secretary of W. C. Holmes & Co. Ltd., has been elected a Director of B.H.D. Engineers Ltd. Also elected as Directors at a recent Board meeting of B.H.D. Engineers Ltd. were: MR. A. J. M. HENSHAW, Director and General Sales Manager of W. C. Holmes & Co. Ltd., and MR. P. CROSET, Managing Director of the Holset Engineering Co. Ltd. B.H.D. Engineers Ltd. comprises the following companies: W. C. Holmes & Co. Ltd., the Bryan Donkin Co. Ltd., George Waller & Son Ltd., British Furnaces Ltd., B. Thornton Ltd., the Holset Engineering Co. Ltd., and Holdan Engineers (London) Ltd.

MR. P. J. C. BOVILL, Managing Director of Newton Chambers & Co. Ltd., has been elected Master Cutler. Three members of the present Board of Directors of Newton Chambers are past Master Cutlers. The Chairman, SIR PETER ROBERTS, was Master Cutler in 1956; COLONEL J. P. HUNT held the office in 1948, and LORD RIVERDALE in 1946. SIR HAROLD WEST, former Managing Director who retired in 1956, was Master Cutler in 1952. The late SIR SAMUEL ROBERTS, father of Sir Peter and former Chairman of Newton Chambers, was Master Cutler in 1935.

MR. W. W. NICHOLAS has left Walker Crosweller & Co. Ltd., where he has been their Midlands representative, to take up a teaching appointment at Birmingham Technical College. He will be succeeded by MR. E. W. TINSLEY, who comes from Radiation, where he was concerned with appliance development. Before that Mr. Tinsley was with the North Western Gas Board.

MR. A. MOORE has been appointed area technical sales representative for Brayshaw Furnaces Ltd., in the territories comprising Northumberland, Durham, Yorkshire, Leicestershire, Derbyshire, Northants and Lincolnshire. Mr. Moore is an associate member of the Institution of Gas Engineers.

MR. J. S. GERRARD, Chief Corrosion Engineer for MAPEL (Metal and Pipeline Endurance Ltd.), is making a round trip to Montreal, Toronto, New York, Trinidad, British Guiana, Venezuela and Jamaica, in connection with MAPEL cathodic protection and welding inspection services.

MR. LESLIE HARDERN, Public Relations Officer of the North Thames Gas Board, has been re-elected Chairman of the Incorporated Society of British Advertisers, an office which he has held for the past two years.

MR. L. C. BLAKE and MR. A. E. PEGGS have been appointed representatives of Crofts (Engineers) Ltd., in the London area. They operate from 34, Norfolk Street, Strand, W.C.2 (Temple Bar 8731).

Half-million holder starts work at Aberdare

The Chairman of the Wales Gas Board, Mr. T. Mervyn Jones, sets in operation the new 500,000 cu.ft. Wiggins dry seal gasholder at Aberaman gasworks, Aberdare, Glam. Pictured are, left to right: Major C. G. Traherne (Chairman, Wales Gas Consultative Council), Mr. M. E. Edwards (Deputy Chairman, Wales Gas Board), Councillor Griff Pitchard (Chairman, Aberdare U.D.C.), Mr. T. Mervyn Jones, Mr. C. Ingman (Divisional Director, Contracts Division, Ashmore, Benson, Pease & Co. Ltd., the contractors.)

Diary

September 25.—NINTH GAS INDUSTRY NATIONAL FIRST AID COMPETITIONS: Friends House, Euston Road, London, N.W.1.

September 29.—LONDON AND COUNTIES COKE SALES CIRCLE. Visit to Wandsworth works of the South Eastern Gas Board to see production and handling of 'Sebrite'—the Board's new open fire fuel.

October 1.—NORTH OF ENGLAND SECTION, I.G.E.: Visit to coal mine.

October 1.—WALES AND MONMOUTHSHIRE SECTION, I.G.E.: Porthcawl. Annnal General Meeting followed by official luncheon and a visit to the Abbey Works of the Steel Company of Wales.

October 2. — SCOTTISH WESTERN JUNIORS: 9, George Square Glasgow. Address by E. G. Smith, Deputy General Manager of Glasgow and Western Division. 6.30 p.m.

October 2.—WALES G.C.C.: Civic Centre, Tenby. Meeting at 11 a.m.

October 7.—COMBUSTION ENGINEERING ASSOCIATION, SCOTTISH REGION: The Grand Hotel, Glasgow. Brains Trust on 'Clean Air and Industry' and a discussion on 'Instrumentation and Smoke Control.' 10 a.m.

October 7.—SOCIETY FOR ANALYTICAL CHEMISTRY: Burlington House, Piccadilly. Meeting on 'Atmospheric Pollution Analysis.' 7 p.m.

One of largest erected by Ashmore

A NEW Wiggins dry seal gasholder of 500,000 cu.ft. capacity was put into operation at the Aberaman gasworks, Aberdare, Glam., on September 16, by the Chairman of the Wales Gas Board, Mr. T. Mervyn Jones.

The holder is 93 ft. in diameter, 94 ft. 6¾ in. high, throws a pressure of from 12.25 to 9.75 and has a seal area of 12,040 sq. ft. The seal is Neoprene rubber on nylon fabric with fully vulcanised joints.

Shares distinction

The work of erection commenced on the site in September last year and the holder was completed ready for painting six months later. The Aberdare gasholder shares with the holder built for the North Western Gas Board at Winsford, the distinction of being the largest built by Ashmore, Benson, Pease & Co. Ltd., although Wiggins holders of up to 2.25 mill. cu.ft. have been built by their associates in France and a 5 mill. cu.ft. Wiggins holder has been built in the U.S.A. by General American Transportation Corporation.

The foundation work was carried out by West's Piling & Construction Co. Ltd. The gasholder was painted by Gilmores Ltd., and the paint supplied by Donald Macpherson & Co. Ltd.

98th ANNUAL GENERAL MEETING AT LARGS

Scottish Association of Gas Managers may become district section of the I.G.E.

MEMBERS of the Scottish Association of Gas Managers, meeting in Largs last week for the 98th annual general meeting, heard their President, Mr. A. McFadyen, Glasgow, say that investigations were being made into the possibility of transforming the Association into a district section of the Institution of Gas Engineers.

Interposing into the proceedings, Mr. McFadyen said: 'The Council has given earnest consideration to the operation of the Association in its present form and have decided that the time has come when recognition must be given to the changes which nationalisation has created, particularly in our own case, as a result of the recent introduction of a new management structure.

Constitution unsuitable

'These changes in the management structure render our existing constitution unsuitable for the new conditions, and the Council have decided, in the best interests of the Association, to investigate what steps are necessary to form ourselves into a district section of the Institution of Gas Engineers.

'I shall not be a party to reducing the effectiveness of the Association, but there is no doubt that closer co-operation with the Institution of Gas Engineers must enhance, to the members, the prestige and technical value of the Association, which otherwise must continue to suffer a steady decline in status and influence. However much we may regret the loss of our traditional Scottish national character, the fact must be faced that the virility of our Association can be sustained only if there is the readiness to adapt ourselves to changing circumstances.

Negotiations

'There have been preliminary conversations with senior members and officials of the Institution of Gas Engineers and with the Chairman of the Scottish Gas Board. Although negotiations may have been exploratory, they will be pursued from now onwards with vigour.

'When concrete plans are available for presentation to the members of this Association, that will be the time for discussion, and our definite proposals will be submitted to a vote of the members at a general meeting.'

The statement was received by members without comment.

It was the second intimation members had received within an hour or so of important change in the Scottish scene. Mr. Sydney Smith, Chairman of the Scottish Gas Board, had announced previously the impending amalgamation of the Northern and Central Divisions of the Board.

Mr. Smith said that the reorganisation of the Board's administrative structure, begun three years ago, was now beginning to get somewhere, but any form of organisation must always have regard to changing conditions.

'During the past 12 months, and after a settling-down period, we have been able to see the strengths and weaknesses of the present pattern. The time has now arrived to proceed to what I hope may be the last stage. At our meeting last Friday the Board agreed to the amalgamation of all functions in the Central and Northern Divisions. This will take a little time to accomplish, and it will be carried through with as little disturbance as possible, but, when completed, we shall have three Divisions in the area—Glasgow and Western, Edinburgh and South-Eastern, and Central and Northern. There is no doubt whatever that the functional form of organisation has proved its advantages. That must be obvious to everyone from the improved results of production, distribution and sales, and the much-improved accountancy control.'

(Present General Manager of the Central Division is Mr. W. Nicol Baird; Mr. H. S. Milne is General Manager of the Northern Division).

Civic welcome

The meeting was opened with a civic welcome from Provost D. M. Brown, who made reference to the impending retirement of the local Manager, Mr. J. Foster, 'after a happy association for the past 20 years.'

Present on the platform were Sir Harold Smith, whose impending retirement from the Chairmanship of the Gas Council, and Sir Henry Jones, whose elevation to the post have been announced. Many appropriate comments were made by the various speakers.

'Autonomy' dropped

Addressing the meeting, Sir Harold Smith recalled that in the earlier years of nationalisation autonomy was mentioned by the chairmen of the area boards on every conceivable occasion. 'We don't hear very much about autonomy today,' he added. 'We hear far more about the need for all area boards working together in the closest possible association in order to see that the new gas industry which is gradually evolving is successful.'

In most area boards there had been considerable reorganisation. Most of them started with a very loose system of delegated command and as time went on

The President, Mr. Alex. McFadyen, addresses the delegates at the opening session.

they had appreciated that some specialist functional control was necessary.

Referring to the search for new ways of producing gas, Sir Harold said that they had been very much disappointed in the matter of a natural supply. They had had a pretty exhaustive search, but the only supply available on a really practical scale was the one in Scotland, at Cousland. Whatever the eventual results might be elsewhere, and there were possibilities in Yorkshire and the East Midlands, certainly at Cousland they were using natural gas which would otherwise have been wasted.

Considerable quantities of oil were now being used in the catalytic cyclic oil-gas processes and the number of plants that were going up increased every year.

Tremendous step

They were carrying out research on the complete gasification of oil. The Scottish Gas Board had taken the tremendous step of putting in the first Lurgi plant in this country. It would use coal which could not be used otherwise except by very expensive preparation. But the Lurgi, good as it was, was still rather choosy.

It had a tremendous effluent problem to deal with. By using hydrogen instead of steam they hoped to reduce the effluent. The way to do that was to gasify oil, which was an easier proposition. Design problems were quite considerable. The task was to make hydrogen as cheaply as they could.

Sir Harold gave a picture of the future, with a national gas grid into which would go all the gases they made, the surplus gases from coke ovens, methane drained from coal mines, gas made, they hoped, by complete gasification of oil at oil refineries and of coal at the coalfields, and liquid methane—all going into the grid at something like 400 lb. per sq. in. pressure, gases containing no sulphur and practically no carbon monoxide.

Underground storage

While the search for natural gas had not been very successful as far as gas was concerned, it had got them on to searching for underground storage on a large scale. That apparently was going to be a much more successful operation, and they could visualise, because of it, gas production plant working at 85 to 90 peak load factor.

'It certainly looks,' added Sir Harold, 'as if there is a tremendous future in this country for the importation of liquid methane. This is something that has caught the imagination everywhere. We reckon that a ship carrying 20,000 tons of liquid methane would carry the equivalent gas that would require 2 mill. tons of coal in a year to produce.'

It was inevitable that all these things would mean a certain amount of redundancy in the industry. It was being dealt with in consultation with the trade unions at whose attitude he had been very gratified.

Mr. Sydney Smith, after his reference to the amalgamation of the Central and Northern Divisions of the Scottish Gas Board, went on to talk of sales.

Left to right: Mr. D. L. Dickson (Perth), Mr. Alex. McFadyen (President), Mr. W. Kirk (Secretary), Mr. J. H. Fulton (Kirkaldy), Mr. W. S. Johnston (Glasgow), Mr. D. C. Elgin (Edinburgh), and Mr. W. Gledhill (Stirling).

'Appliance sales,' he said, 'are buoyant. They are in fact 133% up on last year for the first four months. That is for the area as a whole; the figures in different parts of the country are very much more striking. In Glasgow, for July and August, which includes the Glasgow holiday period, sales were 800% up on the corresponding period last year —£250,000 in value this year compared with £30,000.

One aspect

'The sales of appliances have improved for two reasons—the lifting of hire-purchase controls and the creation of a live selling organisation backed by good publicity.

'But greatly increased sales of appliances is only one, and not the most important, aspect of the problem. For the four months ended on July 31 the sales of gas in most categories were substantially down. Taking the four months' results in total for the area as a whole: Domestic sales were down by 7.5%, commercial by 8.2%, public administration by 13.9%, industrial by 0.5%, and total sales by 6.1%.

'These figures are the measure of the competition we are up against. The warmer weather and the industrial recession have had their influence, of course, but the facts must be faced; we are losing business to a serious extent, due mainly to the all-electric policy of certain local authorities and to electrical competition generally and also to oil, both fuel-oil and paraffin.'

He had no fear that industrial sales would recover. Potential sales to industry, indeed firm commitments, were most encouraging. But the reduction in both domestic and commercial sales was a very serious problem.

'What we need, and what we must have if we are to survive, is a reversal of the present situation. This means that all our efforts must be directed towards new business.'

Mr. Smith said that the preparation and sale of smokeless solid fuel, of a quality and with a service acceptable to the public, had to be tackled. Steps had to be taken to overcome the long-standing prejudice against coke.

Suitable coals

'Discussions are now taking place with the Scottish Division of the National Coal Board which involve a search throughout Scotland for all coals of suitable rank and swelling number which can be made available for the manufacture of high-grade premium cokes. This will involve testing and the assessment of the economics of production, and thereafter consideration of the questions of marketing, distribution and storage.

'It may well be that it will be possible to keep in production otherwise redundant works to produce premium fuels of this type. But here again the economics of production and the suitability of location for economic distribution will have a weighty bearing on any decision which may be made. At this stage it is sufficient to say that the Board are conscious of our obligations to local authorities in relation to their implementation of the provisions of the Clean Air Act.'

Referring to the possibility of importing liquefied methane by sea, Mr. Smith revealed: 'We have already obtained agreement in principle with the British

MEMORIAL LECTURE

THE William Young Memorial Lecture 'Towards 2000 A.D.,' was presented by Sir Henry Jones at the meeting and will be published in next week's 'GAS JOURNAL.'

'A selling plan for gas in Scotland' by H. R. Hart, General Manager, Glasgow and Western Division, together with its discussion, will appear in our sister publication 'GAS SERVICE.'

Mr. S. K. Patterson, Production Engineer, Glasgow and Western Division, gave a paper entitled 'Development of the West of Scotland Gas Grid,' describing the progress that had taken place in the West of Scotland grid since 1957 in conformity with the general plan of integration. A discussion followed.

Petroleum Co. Ltd. for the use of docking facilities and ground for the accommodation of a large shore installation at their Finnart Ocean Terminal on Loch Long.'

Mr. Smith stated that construction work at the Lurgi plant at Westfield was moving forward rapidly. Laying of the super-grid was ahead of schedule, and the crossing of the river Forth east of Alloa would most likely be carried out before the end of this year—six months ahead of schedule. Twin 12-in. diameter steel pipes would be laid in the river bed. The width of the crossing was 2,000 ft., which he believed was the longest river-bed gas-main crossing in Britain. 'It is confidently expected,' he concluded, 'that Westfield works will go into production in a little over 12 months from now, and that all grid-main laying will be completed well ahead of that date.'

Institution A.G.M.

Mr. D. D. Melvin, Edinburgh, conveyed the greetings of the Institution of Gas Engineers, of which he is President, and remarked that everything was being done to ensure a successful annual meeting in Edinburgh. It was almost 50 years since the last meeting of the Institution was held in Scotland and 60 years since it was held in Edinburgh.

He stated that in the meetings he had attended, both at home and abroad, he had sensed a strong feeling of confidence and a great measure of enthusiasm for the future of the gas industry. New ideas and new methods, the application of the newer sciences to gas manufacturing, distributing, utilisation, servicing, marketing and financial problems were very much to the fore.

Contintental praise

'The successful transportation of liquid natural gas across the world seems to have caught the technical imagination of engineers on the Continent. They were loud in their praise in acclaiming the achievement and paid tribute to the pioneering effort of the British gas industry and to the technical skill displayed by British engineers.

'In Germany further developments in the operation of Lurgi plants were under discussion and ways and means of substantially increasing the rated output per unit were suggested to meet long or short-term peak periods.

'The introduction of high calorific value gases and alterations to the normal gas-making cycles might make these plants even more flexible than was originally thought. These developments are, of course, very much in our own minds for Westfield.

Re-assessment

'All this upsurge of activity and change of method and outlook means for many of us a reorientation of outlook, a re-assessment of old values and some measure of personal re-education. We must ensure, too, that the education and training of the young gas engineer and of new entrants to the industry is properly directed. The Institution is engaged in re-drafting its education scheme syllabuses, in reviewing the standards required, and in providing for a moderate degree of specialisation to suit the differing needs of the industry as its new organisation evolves.'

Mr. Melvin said that every opportunity should be taken for the discussion of current technical problems. The Institution meetings provided platforms, but more required to be done by some district sections and associations to continue discussion in a more detailed fashion and to a wider circle. 'Such an evolution might mean changes in the constitution of our own Scottish Association of Gas Managers, even to the extent of considering the formation of a district section. If this came about, I know that the Institution would be very happy to assist in resolving many of the problems involved. However, that is a matter for discussion and decision in due course.'

Mr. Melvin concluded with an expression of thanks for the substantial special contribution again made to the Benevolent Fund.

Mr. J. A. Beckett, Ministry of Power, congratulated the Board on the Westfield project and looked forward to the time when 'the Lurgi monster would extend its benevolent tentacles over vast areas of Scotland.'

In presenting the report of the Education Committee, Mr. D. Beavis appealed to members to give as much opportunity in practical training as possible. 'When vacancies in the establishment occur, it is very tempting to seek a ready-made applicant. But it is often wrong, and such vacancies are the opportunity to try the mettle of young men of aspiration.'

Presentation of associate membership examination certificates was made to: Mr. J. D. Armstrong, Paisley; Mr. C. R. Baikie, Greenock; Mr. B. R. Gloag, Edinburgh; Mr. J. B. Gray, Greenock; Mr. K. H. Marrows, Saltcoats; Mr. J. N. Martin, Biggar; Mr. J. T. Meikle, Rutherglen; Mr. S. S. Roberts, Stirling.

It was stated that the following applications for ordinary membership had been passed: Mr. L. Morrice, Kirkwall; Mr. G. C. Wood, Karachi; Mr. A. Higgs, Glasgow. The following had been recommended for life membership: Mr. J. Ballantyne, Goivan; Mr. J. Dickson, Kirkintilloch; Mr. A. D. King, Bo'ness.

The Chairman of the Scottish Gas Board gives his paper. On the speaker's right are Mr. Wm. S. Johnston (Glasgow), Mr. D. D. Burns, O.B.E. (Deputy Chairman, Scottish Gas Board), and Sir Henry Jones, M.B.E.

President's Address

COMPLEX PROBLEM OF ECONOMICS AND MARKETS

IN his presidential address Mr. McFadyen reviewed the present functional structure of the Scottish Gas Board, the improvements which had been effected, and the inter-relationship between functions.

He said that although every function had been subjected to change and a measure of progress had been achieved, greater emphasis had been placed upon the operations of the two main functions—production and sales. The imperative need was to harness the most efficient and effective methods of production now available to plans for the extension of sales of the greatly increased quantity of gas being produced, or about to be produced, from new sources of supply.

The gas industry in Scotland was in a transitional stage. New sources of supply and new methods of production were being explored. During the period of development, everything possible was being done to concentrate production in the most efficient and largest production plants, which were being inter-connected by grid mains to ensure maximum flexibility and economy. Investment of capital, no matter how large this might be, which produced gas at a price which was competitive, when compared with other sources of heat, must be met, and therefore the industry, during the next few years, would have to face a complex problem of economics and markets.

With the setting up of smoke control areas in an increasing number of districts, demands on the gas industry for fuel were bound to increase. The call for adequate supplies of good domestic coke might suggest that the industry's interest in new methods of gas production, which involved no corresponding production of coke, might be a mistake. Although the

Continued on p. 343.

Cwm COKING PLANT

A review of the N.C.B.'s new development in Glamorgan

By CHARLES J. P. de WINTON, *T.D., M.A., M.INST.GAS E., M.INST.F.,*
Technical Editor

Illustrated by STEPHEN TENNANT A.R.P.S.
Staff Photographer

THE commissioning of the new coking plant at Cwm, near Pontypridd in Glamorgan, is a further step forward in the completion of its plans for greater coke production in modern plant by the South Western Division of the National Coal Board.

At nationalisation the coking plants taken over by the N.C.B. in this division were at Bargoed, the Maritime coke works at Pontypridd and plants at Coedely and Tondu. The plant at Bargoed consisted of 186 ovens in three batteries of 50 ovens and one of 36. Two of the former batteries were old fashioned Koppers ovens, dandy-charged and in a poor state of repair. Of the other two batteries—both by Carl Still—the 36-oven battery, built in 1929, was a modern silica plant, larry charged, with wedge type doors and a modern pusher and coke guide but without modern quenching. At Maritime, there were two batteries, one an old Otto battery of 32 ovens and the second, a composite battery

A view of the works looking north. The coke oven batteries are seen on the right, the purifiers and the by-product plant on the left. The colliery buildings in the distance.

of six Koppers circulation ovens and 24 Carl Still ovens. This battery, built in the middle 1930's, was constructed of high grade fireclay, and was used for foundry coke production. Of the other plants, there were 30 Coppée regenerative ovens at both Tondu and at Coedely.

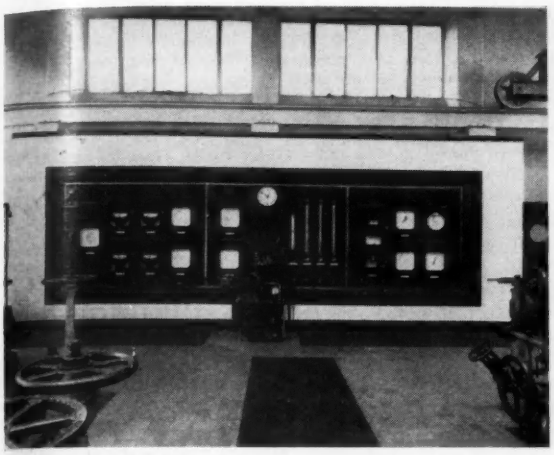
The need to extend and replace obsolete or obsolescent plant made it necessary to replan the coking plants in the area. Only at Coedely was there any space for expansion, since the plants at Bargoed and Maritime were situated in narrow valleys, added to which most of the existing ancillary plant was obsolete. The N.C.B. therefore decided to implement the original plans worked out before nationalisation and to build a large modern plant at Nantgarw, south of Pontypridd, which would have easy access for coal supply and for the despatch of coke and by-products. It was also conveniently placed for connecting up to the proposed gas grid being planned by the Wales Gas Board. The Coedely plant was extended by building three batteries of modern Coppée underjet ovens, two of 20 ovens and one of 30.

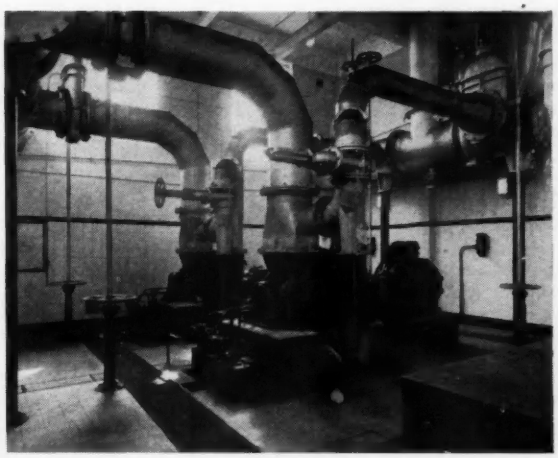
The manufacture of foundry coke in the late 1930s at Maritime had created a large demand for small coal from Cwm colliery. Though within a few miles, the transport of this coal to the Maritime washery was quite a complicated business, since the mountainous nature of the country made quite a long railway haul necessary. The Cwm colliery was comparatively new with modern electrically driven surface machinery and an unusually large shaft for that time, capable of winding large quantities of coal. It was, therefore, decided to build an entirely new coking plant of modern design adjoining the colliery, complete with a modern coal washery. With the commissioning of this plant, the carbonising plants at Bargoed, Maritime and Tondu, have been closed down, leaving the plants at Nantgarw, Coedely and Cwm, together with the now greatly extended Phurnacite plant at Aberaman, near Aberdare.

Green site

The site on which the new works was to be built was strictly speaking a 'green field' site, in that no plant had been previously built on it, but in actual fact it was a narrow shallow valley, running north and south at a height of approximately 400 ft. above sea level, and about 200 ft. above the town of Pontypridd about four miles away. The colliery is situated at the northern end of the valley and the new coal washery adjoins it. It was necessary to carry out a considerable amount of civil engineering work to adapt the site before the works could be built. This took the form of four levelled terraces, three on the west side and one on the east side of a main road constructed to run through the centre of the completed works. To facilitate the calculation of the levels and to assist in reducing excavation work to a minimum, a sand model was made of the site and was used in the discussions and planning of the works.

The carbonising plant, including the coal blending bunkers and the coke screening plant, occupy the area to the east side of the works, while the three levelled areas on the west side are occupied by the by-product plant, the exhauster house including the sulphate plant, and the purifiers respectively.





Left: *The interior the exhauster house showing the instrument panel, and in front of it, the Askania governor controlling the exhauster pull. The modern design of the building and the good working conditions are immediately apparent.*
Right: *The interior of the booster house, showing the electrically-driven blowers for pressurising the gas before the purifiers.*

At the extreme north end of the works, running at right angles to the central road, are the stores and the engineering repair and maintenance shops. At the extreme south end are the compressor house, two gas holders and two reservoirs holding 3.75 mill. gal. each, into which all clean effluent water is stored. In this area too is the works power house.

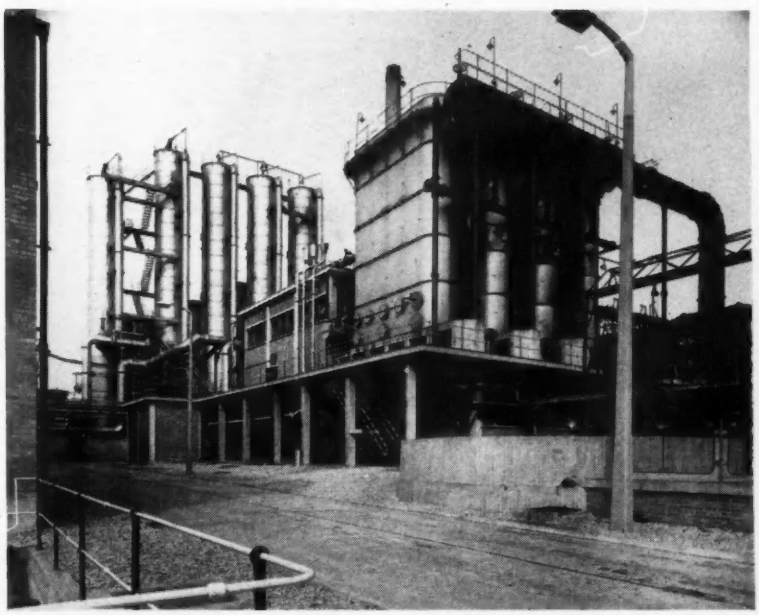
Water problem

A problem which had to be solved when this site was chosen was the supply of water to the new works, since it is not self supporting in this respect. It was solved by utilising the water normally pumped from three collieries in the vicinity. Water formerly used at the Maritime coke works, both that coming from the Maritime colliery itself and also from the Penrhiw pit, is brought underground to the Cwm site and pumped up to the works' reservoirs at the Cwm colliery to the north of the works. Water pumped out of the Hetty pit, between Pontypridd and Porth in the Rhondda Valley, is also brought to these reservoirs. Surplus water overflows to the two new reservoirs at the south end of the works which hold a week's supply. The working reservoirs are kept filled by night pumping from the main reservoirs.

The chief contractors for the construction of the new works were Simon-Carves Ltd., who made the original survey of the site. From this survey the N.C.B. carried out all the civil engineering work and all work connected with the water supply.

The carbonising plant consists of four batteries grouped in two pairs, each of 27 ovens and divided by a single coal service bunker placed centrally. The ovens, of orthodox design, are the Simon-Carves underjet, compound type with a single waste gas flue. High grade silica has been used in their construction from the regenerator arch up to the top of the oven arch, below and above which fireclay has been used. A total throughput of between 1,350 and 1,530 tons of coal a day can be carbonised depending on the carbonising time. At the present time foundry coke with a carbonising time of 29 hours is being made. Modern control machinery has been installed and each pair of batteries has its own automatic change-over gear with which is fitted the necessary alarm system to give adequate warning before the change-over is going to take place. Askania governors, manufactured by Reavell & Co. Ltd., control the rich gas pressure, the chimney draught and the collecting main pressure. The burning gas is preheated to 45°C. to avoid its temperature falling below its dew point, and its flow is measured and integrated.

Twin collecting mains have been installed in accordance with modern practice with an Askania control governor for each main. During the



A section of the by-product plant showing, on the right, the (indirect) primary condensers and the exterior of the exhauster house. In the background can be seen the secondary (direct) coolers and the benzole scrubbers. On the left is a corner of the sulphate plant house.

latter part of the carbonising period of any individual oven, it has been found beneficial to disconnect one side's ascension pipe from the collecting main and take all gas off from the other side. The reason for this is the long carbonising time needed in the production of the foundry coke—well known to its users as 'Crown Foundry.'

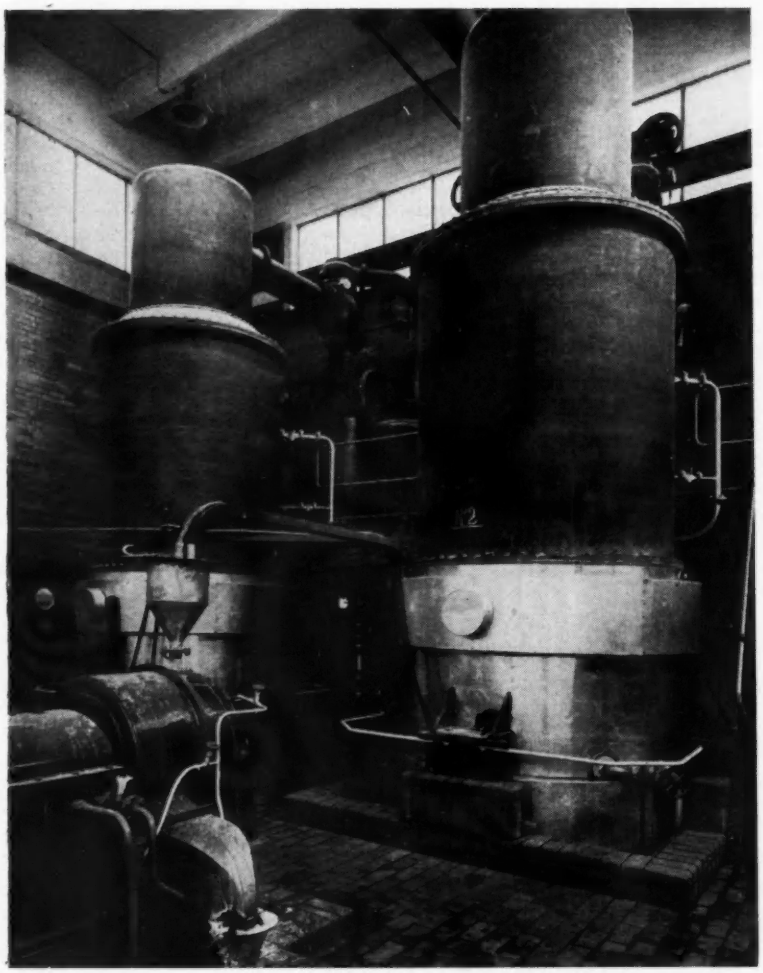
Coal for carbonising comes from the adjoining Cwm colliery where it is washed in a Chance washery to an ash content of between 4½ and 5%. Included at this washery is a mineral separation type plant which, by the use of oil, will effectively wash very small coal down to these low ash contents.

The coal with a volatile content of 22.5 to 23% is brought by belt conveyor to four cylindrical blending bunkers. At present blending is being carried out, and these bunkers with a capacity of 2,000 tons of coal are being used for coal storage. From here it passes to a British Jeffrey-Diamond pulveriser of 160 tons per hour capacity where it is reduced to a grading of 90% through ⅛-in. mesh. The total amount of coal needed amounts to 9,500 tons per week. The coal is transported by belt conveyor to the ovens' service bunker of 3,000 tons capacity, which is of the slot-type. Reciprocating feeders at the base of the bunker supply coal to short conveyor belts which in turn feed coal to the four hoppers of the larry charger. Emergency chutes have been installed for gravity feeding in case of power failure.

All coal is weighed before charging by means of Avery weighers incorporated in the rail track. Each of the larry hoppers is fitted with a vibrator to assist coal flow; telescopic connections to the oven charging holes and the use of steam injection in the ascension pipe during charging minimise air pollution.

To ensure perfect alignment between the pusher machine and the coke guide on the one hand, and the correct positioning of the coke-car on the other, a special electro-magnetic device has been installed on all four batteries. This takes the form of an electro-magnetic transmitter placed under the floor of the coke guide. Suitable receivers are distributed in the cellar underneath the coke guide railtrack corresponding to each oven. These are wired in series to a corresponding set of transmitters located on the wall in the machine side cellar from which a signal can be sent to a suitably placed receiver on the pusher machine. Incorporated in this system is a speech circuit by which, when the two machines are lined up to the same oven, but not before, the two drivers may converse. The guide driver moves the guide trough into position and closes an interlock switch. Unless the interlocking switches between the coke-car and guide, and the coke guide and the pusher are closed, the ram beam is unable to move forward for pushing the oven. Should the coke-car, however, pass the guide before the pushing of the oven has been completed, the ram beam is stopped by the opening of the guide-coke-car interlock switch as the coke-car passes the end of the guide. In this way the danger of coke being pushed on to the coke-car locomotive is avoided.

A modern quenching system has been installed by which a measured volume of water quenches each batch in a suitably placed quenching tower. The coke returns to the battery where it is discharged on to a coke bench, big enough to hold ten charges or 120 tons. Door changing and repair stations are provided on each pair of batteries. The provision of a device for turning the door over while still keeping it in a horizontal position saves much time and a great deal of unnecessary handling. All doors are of the latest Wolf self-sealing type.



The two vacuum evaporators in the ammonium sulphate house. In the left foreground can be seen one of the two Krauss Maffi continuous centrifuges. The clean appearance of this type of plant is most noticeable.

Coke screening

Coke, with a moisture content of about 1½%, is carried by a 42-in. belt to the screening plant and passes over a 3½-in. Grizzley screen. The oversize, foundry coke, is boom loaded into railway wagons, or into lorries for transport by road to the Midlands, by which means this works despatches about 1,800 tons a week. The coke passing through the Grizzley screen is taken to secondary vibrating screens for sizing for domestic use, where it is stored in bunkers and debreezed before loading. Sized coke may be taken to or reclaimed from stock by belt conveyors, working in conjunction with crane grabs. The total coke stocking capacity is 300,000 tons.

The gas from all four batteries is

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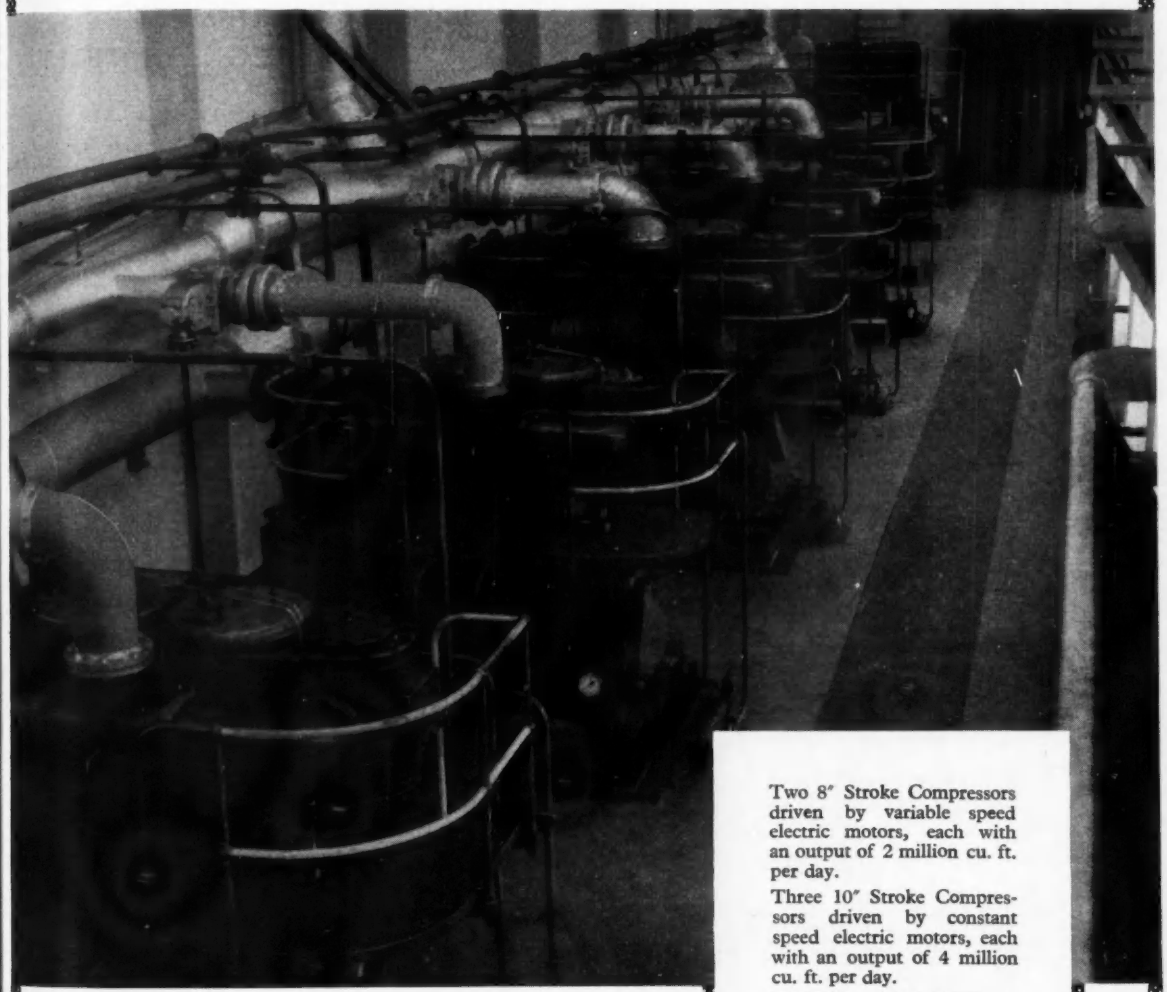

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This illustration shows one of the Donkin installations at the Cwn Coke Oven Plant, South Wales.

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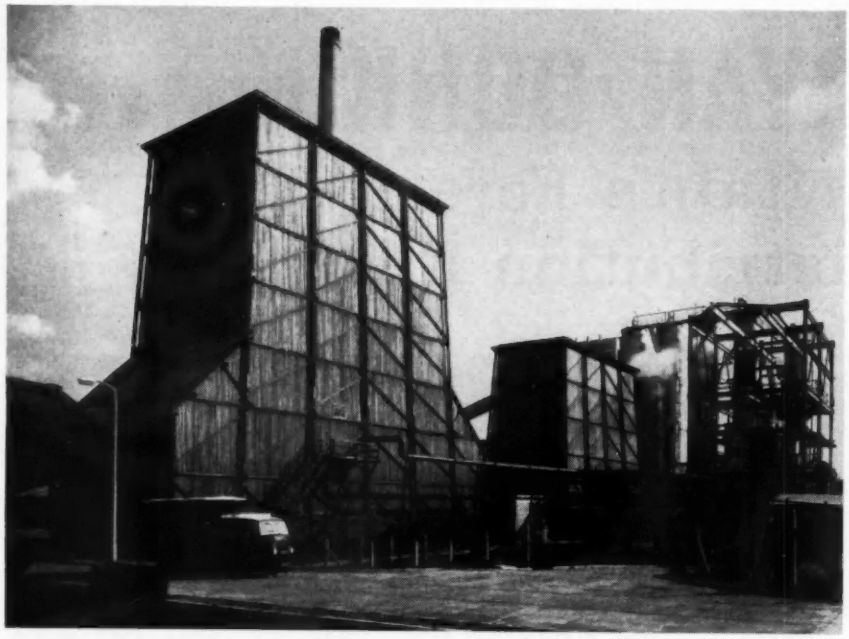

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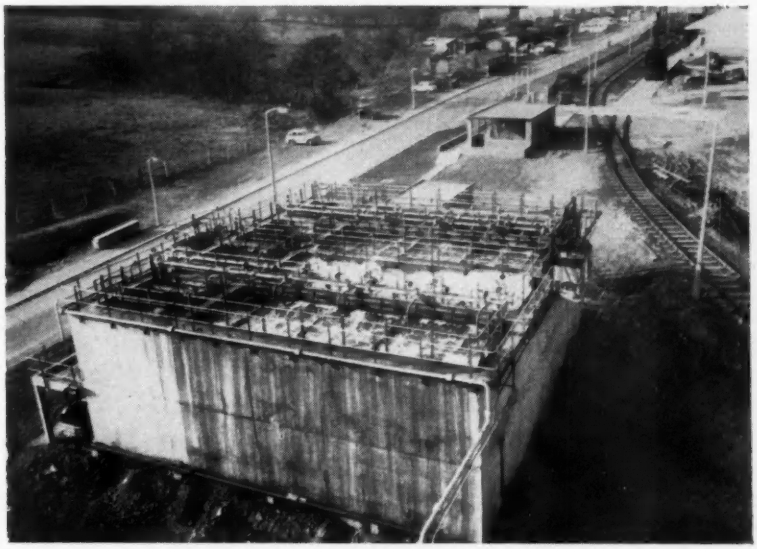
brought by a common foul main of 48 in. diameter to the ancillary plant. A mechanical catch tank has been provided complete with a slow, continuously moving scraper conveyor. This removes any solid material which separates out at this stage and may cause a blockage. Any subsequent difficulty caused by its removal is thus obviated. There are four primary condensers of the indirect type, each provided with five gas and five water passes, manufactured by C. & W. Walker Ltd., from the designs and drawings of Simon-Carves Ltd. Their capacity as with all the ancillary plant installed at this works, unless otherwise specified, is .7 mill. cu.ft. per hour, which is equivalent to a throughput of 1,530 tons of Cwm coal per day. The condensers are mounted on the roof of the building which houses the tar and liquor pumps—all electrically driven—and the small air compressor supplying the compressed air reservoir at 90-100 p.s.i. from which air for the instrumentation is taken at 20 p.s.i.

Gas temperature is controlled by air operated Fisher valves so that it remains constant at 35°C. at the outlet of these condensers. There are two 3-stage turbo exhausters driven by 2-stage steam turbines running at 5,900 r.p.m. These machines are designed by Brown Boveri & Cie, of Baden, Switzerland, and supplied by Richardsons, Westgarth & Co. Ltd.

The exhauster house, a remarkably small room for the amount of gas handled, contains an instrument panel on which are mounted gas temperature and pressure recorders, single glass water pressure gauges, and gas flow recorders and integrators. Steam to the benzole and ammonia plants is also recorded here. The gas passes to the electrostatic detarrers on its way to the ammonia plant. There are three electrostatic detarrers, supplied by Simon-Carves Ltd., which are capable of reducing the tar content by 99.5 ± .5% or to an actual content of .6 grains per 100 cu.ft.

Advantages

The ammonia plant is of the Simon-Carves evaporative type, which shows some very specific advantages over other systems, including the semi-direct system, the chief disadvantage of which was that it was continuous and made necessary the employment of shift labour, since it was quite impossible to store a saturated solution of ammonium sulphate. By the evaporative process, however, the sulphate solution is maintained below saturation; it can, therefore, be stored and treated later. An absorber, a simply designed bubble-hood tower with two effects and made of Monel metal, absorbs the ammonia in the gas passed through it by dilute sulphuric acid pumped on to the top tray. It flows counter-current to the incoming gas. The acid circulation rate and the amount of fresh acid added, is adjusted so that the bleed-off consists of a concentrated solution of ammonium sulphate just below saturation point. This solution can be stored and pumped to the evaporator as required. The evaporator is of the normal calandria type operating under reduced pressure. The water is driven off from the solution and the sulphate crystals produced are pumped to a



The concrete tank containing the solution of bacteria for destroying the phenols and thiocyanate in the spent liquor from the sulphate plant.

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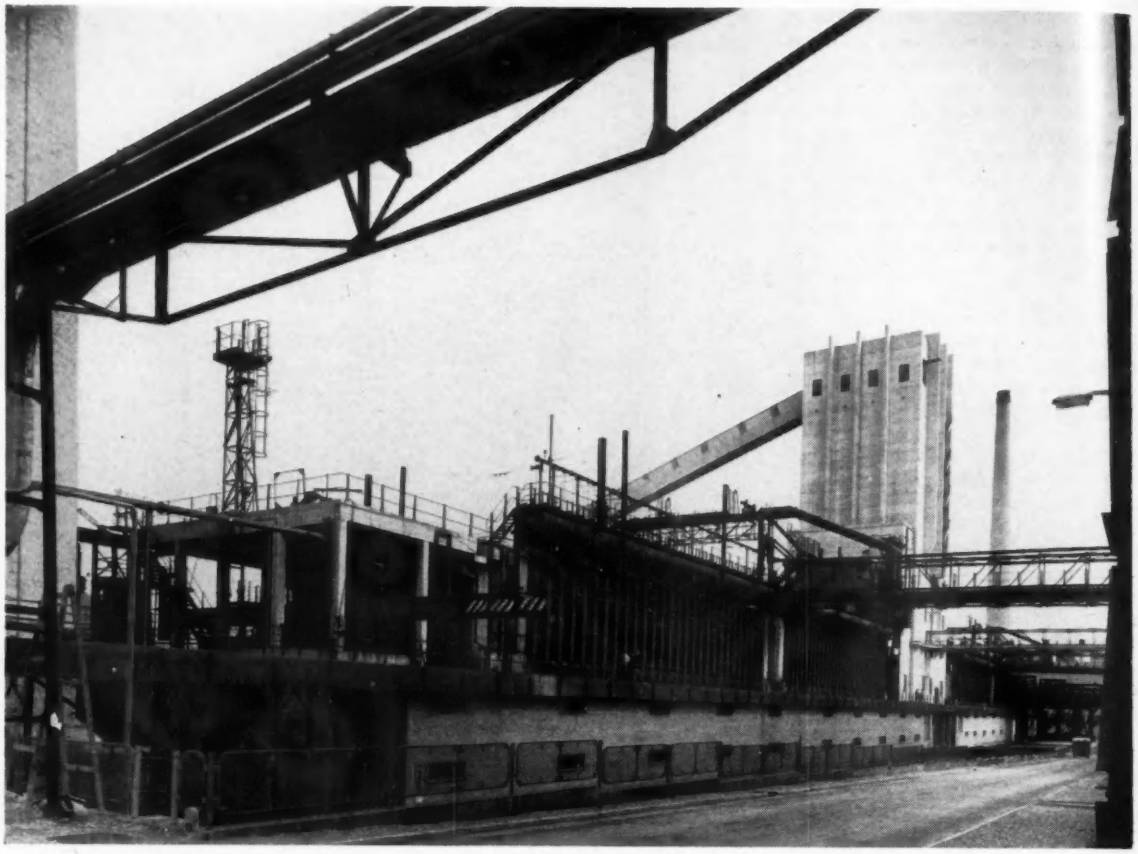


A general view of the coke oven batteries, showing how they are divided up into pairs with the bunker in the middle. The ram changing station is seen on the left. The difference in level of the ground between the central roadway and the battery pad can be easily seen.

centrifuge; from here the separated liquor returns to the circulating system. The 'whizzed' crystals are then handled in the normal way. All condenser liquor is treated in a normal ammonia still and the ammonia vapour produced added to the gas before the absorber.

At Cwm there are two absorbers, one standby of the two stage bubble head type, constructed throughout of monel metal. Dilute acid is added to the circulating tank and then pumped to the upper section of the absorber, overflowing to the lower section and then flows back to the circulating tank by way of a tar skimming tank. Recirculation of the solution is continued until the sulphate content suitable for evaporation is reached.

A portion of the circulating liquor is then bled off to the stock tanks. These are of sufficient capacity to hold three days' make of sulphate solution. This is then pumped to the evaporator, which is of the calandria type, and operates at 150°F. and 28-in. Hg. vacuum. The reduced pressure is produced by means of a jet condenser. The magma. containing approximately 50% crystal sulphate is pumped to a Kraus Maffei continuous centrifuge supplied by W. Wykeham & Co. Ltd., which is constructed in stainless steel, and has a capacity of at least one ton per hour. The liquor from the centrifuge returns to the circulating tank and the sulphate crystals are taken by conveyor to a Dunford Elliot hot air dryer. The sulphate which is of grade 1 quality is automatically weighed on discharge from the dryer and is pneumatically handled to the storeroom floor or for bulk loading into transport. The evaporators work continuously until the stock of sulphate solution is reduced to a minimum. This takes 2½ to 3 days and the plant is shut down until the stock tanks are refilled once more.

Secondary coolers

After leaving the ammonia absorbers, the gas, the temperature of which has risen to about 48°C. passes to the secondary coolers, which are of the direct splash bar type. There are two of these coolers, one of which the gas enters before the primary naphthalene washer and one between this and the benzole scrubbers. The first reduces the gas temperature to 37°C. and the second to between 20 and 25°C.

The three benzole scrubbers are the conventional type packed with wooden grids and the washing medium is B.A. oil. Working in series, recirculation is practised in the first and second while the oil and gas pass countercurrent to each other in the third. The benzolised oil is pumped to a completely automatic Simon-Carves benzole recovery plant and the cooled stripped oil returned to the scrubbers. The crude benzole recovered amounts to 2.5 gal. per ton of coal carbonised, a yield from a coal of this type which is considered quite satisfactory.

Working in conjunction with the ancillary plant are three Bradford cooling towers, constructed of wood and supplied by the Davenport Engineering Co. Ltd. The first tower is primarily for the primary condensers and the benzole plant and all cooling water from the benzole plant and the condensers passes through it. The second tower cools the water from the direct secondary coolers which passes on to the quenching tower storage tanks. The third tower cools water

for the jet condensers used for reducing the pressure in the vacuum evaporators at the sulphate plant. Make-up water is added at the primary condensers cooling tower, passes via the sulphate plant cooling tower to that of the direct coolers, and thence to the quenching water tanks. As mentioned previously, the supply of water to this works is one of some difficulty, so care must be taken that none is wasted. This cooling tower system has been found to work quite satisfactorily.

All crude benzole is sent by rail to the Nantgarw works for rectification and all tar to the central tar distillation plant at Caerphilly, where all tar made in the South Western Division's carbonising plants is refined.

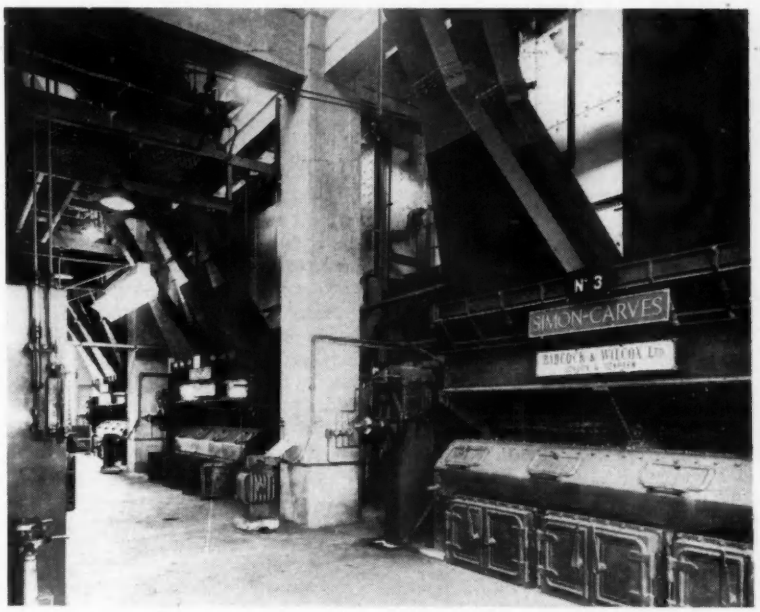
First demand

After leaving the benzole scrubbers there are four courses open to the gas. It may return to the coke oven batteries as rich gas for oven heating, pass to the works power station for steam raising, pass to the purifiers before entering the Wales Gas Board's grid main, or, if the pressure in the main rises due to lack of demand from any of these destinations, a valve to an automatically ignited bleeder flare allows gas to be blown off to atmosphere. The demand for rich gas to the oven batteries, amounting to approximately 40% of all gas made, must first be met, and to ensure that the system has more capacity than that of the gas mains an unpurified-gas holder of .25 mill. cu.ft. capacity with a single inlet/outlet connection 'floats' on the system. Gas for sale to the Wales Gas Board passes to a booster plant where its pressure is raised to overcome the back pressure from the purified gas holder, amounting to 16 in. w.g. on the top lift, and any possible additional back pressure from the purifiers. The gas supplied to the power station boilers acts as a 'balancer' to the system and is the first to be cut off in times of shortage.

A final naphthalene washer, supplied by Simon-Carves Ltd., has been installed before the boosters. These are two Bryan Donkin centrifugal blowers, electrically driven, one standby, with a capacity of 10 mill. cu.ft. per day. Provision has been made for a third.

The purifiers, also with a capacity of 10 mill. cu.ft. per day, are of the tray type supplied by R. & J. Dempster Ltd., and consist of five boxes in line 44 ft. 3 in. by 30 ft. 6½ in. by 17 ft. 11 in. deep built as one box and partitioned. Each box contains 24 trays, 13 ft. square by 3 ft. 10 in. deep, the jointing between each of which consists of Foliac packing.

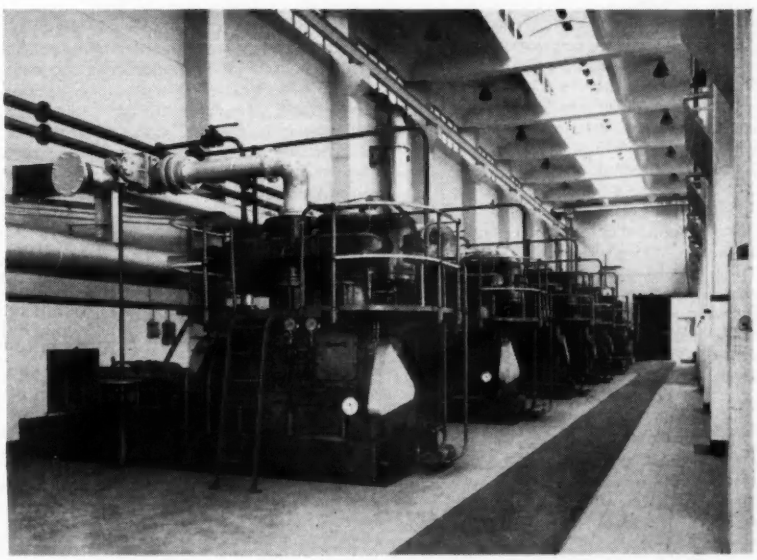
A gas heater installed before the boxes can raise the temperature of the in-going gas through 50°F.; every box has an individual fitting for direct steam and water connections. Air to the boxes for revivification *in situ* is supplied by Rateau type blowers electrically driven by vee belt and capable of delivering 20,000 cu.ft. of air per hour. The purifier boxes are rotated every 24 hours and all valves are protected by water seals. An electrically driven Goliath crane handles the trays during the changing of the boxes and a spare set of 24 trays has been provided for this purpose. A suitable oxide shed has been built on the west side of the plant.



The interior of the works power station showing three of the Simon-Carves high pressure boilers fitted with chain grate stokers.

Gas testing

The gas passes to the purified gas holder, of 1 mill. cu.ft. capacity, the property of the Wales Gas Board, and thence through a Holmes-Connersville 26 in. by 78 in. station meter of .75 mill. cu.ft. per hour, fitted with



The interior of the compressor house showing the five Bryan Donkin compressors, electrically-driven through the gas-tight curtain wall on the left. The spacious, light and airy design of this building is most striking.

P.V.T.T. equipment for recording temperatures, pressures and volumes, to the compressors.

There are five Bryan Donkin vertical compressors, all electrically driven through a gas tight partition. Of the five, two have a capacity of 2 mill. cu.ft. per day each with a variable speed drive, and three are of 4 mill. cu.ft. per day capacity working at constant speed. To keep a check on the calorific value of the gas leaving the works, a Fairweather recording calorimeter, supplied by Scientific and Projections Ltd., has been installed in the gas testing house, which completes the gas handling equipment. The declared calorific value of the gas is 490 B.t.u. per cu.ft.

As has been pointed out, a compound coke oven system has been installed. Under present operating conditions, rich gas is being burned for oven heating, making available approximately 8 to 9 mill. cu.ft. per day for sale to the Wales Gas Board for town gas distribution. Should the demands of the Board increase, more gas can be made available by the use of producer gas at the coke ovens. Although provision has been made in the plant layout for building the necessary gas producers and any necessary ancillary plant, their actual installation has been deferred. The selective burning of rich gas or producer gas at one or all of the batteries, should make the plant extremely flexible in gas production. Since the only part of the ancillary plant which would have to be added to are the purifiers, provision has been made for increasing their capacity at a later date.

To provide steam for the works and at the same time thermally integrate the whole project, an electricity generating station has been built at the south end of the works. Steam is raised in Simon-Carves water tube boilers, fitted with chain grate stokers supplied by Babcock and Wilcox Ltd. These boilers can be fired by unpurified gas, coal, a coal/coke breeze sandwich or any suitable combination. Steam is raised at 450 p.s.i. for driving the turbo-generators. Steam is passed out at 130 p.s.i. into the works high pressure steam range operating at 120 p.s.i., from which it is taken to the turbo-exhausters. Pass-out steam from these machines enters the works low pressure system, which after saturation by desuperheating equipment supplied by Hopkinsons Ltd., is used for process work and space heating in the works, the colliery and the local offices of the N.C.B.

The problem of the disposal of the effluent from the ammonium sulphate plant has been solved by a most ingenious process. Following the experiments carried out by D. E. Cunningworth at the South Western Division's research laboratory at Ystrad Mynach, a means of destroying any residual tar acids and thiocyanates present in the effluent liquor by bacteria has been worked out. The resultant liquid passing into the local brook conforms in every respect to the demands of the local river board. Suitable bacteria are introduced into a vessel in which is placed the necessary carbon-free nutriment. The bacteria culture is contained in a reinforced concrete tank containing baffles, through which the effluent is passing. By the time the effluent has reached the outlet of the tank, the harmful constituents have been rendered innocuous. This process differs from other systems in that the bacteria for the disposal of both substances are introduced together and not in successive stages.

Attractive amenities

Amenities at this works have not been forgotten. The space underneath the coke oven service bunker houses in addition to the heating control room for the operating of the batteries, changing rooms, ablutions, a messroom and a canteen. Provision has been made for properly ventilated lockers for disinfecting working clothes and separate lockers for storing tidy clothes. The men may bring food for heating up and can eat it in clean, attractive surroundings. Plenum heating has been installed throughout.

The offices on the west side of the site are in a well designed modern building, and a comprehensive telephone service has been installed between them and any part of the works. In this way sections of the works can communicate with each other by automatic telephone and with the appropriate department within the offices. There are 60 subscribers. In addition to this a second telephone system in the works is connected to the main office switchboard by which external calls may be made direct from the works.

Throughout the works, the maximum use is made of electrical power and where necessary fluid drives have been installed. The electric motors have been supplied by several firms, among which was the Metropolitan-Vickers Electrical Co. Ltd. In all cases power is received from the national grid with the N.C.B. electrical grid system as a standby supply. Electric power generated at the works power station is fed into the N.C.B. grid. As a further standby the power station can supply power solely to the works and the adjacent colliery. Steam driven prime movers, other than the turbo-exhausters, are only used as standby in case of power failure or for the provision of low pressure steam for process work.

HIGH-EFFICIENCY CLAUS KILNS TO BE BUILT BY HOLMES

THE Chemical Engineering Division of W. C. Holmes & Co., Ltd., which has built a number of Claus kilns based on the older processes, has now taken up the manufacturing rights to build modern kilns based on plant developed by Courtaulds, Ltd., and constructed at their Trafford Park works.

These are of the latest design incorporating full heat recovery. The efficiency of conversion is 90/95% and the tail gases discharged to atmosphere fully satisfy the requirements of the alkali inspectorate. The Trafford Park plant comprises two kilns, each having a capacity of 30 tons of pure sulphur per day.

Sulphur separated

The hydrogen sulphide, mixed with one third of the air required for complete combustion, is burned in a combustion chamber and then passed to a waste heat boiler where high pressure steam is generated. Some sulphur is produced during combustion and cooling and is separated before the gases pass to two catalytic vessels where the reaction is completed. Sulphur is separated after each catalytic stage and the temperature is adjusted to that required for the next stage. A final combustion and absorption stage completes the process. The sulphur is recovered in liquid form and can be pumped to another process or cast into blocks of convenient form. The solid sulphur can be ground to flowers of sulphur of high quality.

Licences have also been acquired from the Gas Council for the use of their processes covered by patent Nos. 769, 995 and 769, 996 which enable Claus kilns to operate at higher conversion efficiency by the recycling of gases round the catalyst and to produce better effluent gases by catalytic combustion of the final traces of hydrogen sulphide.

The Claus kiln can be applied to the conversion to sulphur of hydrogen sulphide recovered from fuel gases such as coal gas and natural gas or to waste gases from sulphate of ammonia plant.

Footnote: The Claus kiln, originally introduced about 1890, has undergone many improvements, especially since the development of the Baehr process some 20 years ago.

Scottish Association A.G.M.

Continued from p. 328.

benefits to be gained from the vast new development for production of gas by complete gasification of low-grade coal at Westfield, Fife, and other new sources of supply being developed, or about to be developed, would not be fully available for a few years, he was convinced that by that time they would be selling gas at a price which was competitive when compared with other fuels. As a result, gas eventually would establish itself as the main answer to the clean air problem. There should be ample supplies of coke available for some years to come, and action had been taken to produce coke from selected coals to provide for the domestic market a fuel of adequate specification.

Mr. W. S. Johnston, Glasgow, proposed a vote of thanks to Mr. McFadyen, Mr. Beavis seconding.

It was announced that the result of the ballot of members showed that Mr. D. L. Dickson, Perth, had been appointed Junior Vice-President and that Mr. G. J. B. Cox and Mr. S. K. Patterson had been elected to the Council.

Mr. W. S. Johnston was formally invested as President, and in taking office stated that, in view of his long association with Dundee, he would like to see the next annual meeting held in that city. Mr. G. Hannah, New Cumnock, presented the President's memento to Mr. McFadyen. A vote of thanks to all who had taken part in the proceedings was proposed by Mr. W. M. Gledhill, Stirling.

Laggards upset Scotland's smoke abatement plans

THE slow progress being made in Scotland in the setting up of smoke control zones in the worst pollution areas throughout the country, is a disappointment for the Scottish Department of Health.

In the 2½ years since the Clean Air Act came into force, only four local authorities have submitted areas for confirmation and only one scheme is in operation.

Three smoke control areas have been confirmed for Edinburgh, Glasgow and Dundee. One order for Dumbarton has been made but not yet confirmed. Proposals have been approved in principle for Coatbridge, Perth, Paisley and Kirkcaldy, and are still under consideration for Grangemouth, Hamilton, Kilmarnock, Kirkintilloch and further areas of Edinburgh and Glasgow.

A circular has been issued by the Department asking the authorities to prepare a five-year plan for smoke abatement and to convey their conclusions by December 31. The Department also asks that all buildings in new housing areas should be equipped with appliances capable of burning smokeless fuel.

MULTI-PURPOSE VEHICLES FOR NORTH THAMES

THE North Thames Gas Board, serving over 1,000 sq. miles in and around London, has ordered 12 special multi-purpose vehicles from Albion Motors Ltd., of Glasgow. The Board has already much operational experience with alternative tipper-platform bodies for each chassis, and now proposes to go one stage further by ordering chassis on to which any one of three alternative bodies can be mounted, viz., platform, tipper or box.

Coke Deliveries

The platform bodies are for sack coke deliveries and the tipper bodies for bulk coke deliveries during the peak season of coke supply. During the off-peak season for coke—normally the period of heavy demand for appliances such as refrigerators, washing machines and laundry appliances—the box bodies will be used.

These vehicles, based on Albion Chieftain seven-ton haulage chassis, are specially designed so that either of the three alternative bodies can be mounted.

Convertibility is made possible by using flitch plates on the outsides of the frame members and fitting an easily detachable frame extension piece which is bolted on when used with a platform body.

Suppliers

The platform and box bodies will be supplied by the Redhill Body-building Industries Ltd., while the tipping bodies, together with Anthony Hoist tipping gear, will be provided by the Steadman Engineering Co., Ltd.

Gas-fitting students also take general subjects

WHEN the new term began at Southampton Technical College on September 21, the Department of Building commenced a full-time course for first-year gas fitting apprentices in conjunction with the Southern Gas Board. The course is described as a pilot scheme.

Says Mr. D. L. Hill, the Board's Training and Education Officer: 'Although there has always been gas fitting apprentice training, the idea of full-time apprentice training based on the technical colleges is relatively new to the industry, and is a good example of the results that can be obtained from close teamwork between industry and the local education authorities.'

The apprentices will do a full 9 a.m. to 5 p.m. day, and will spend about one-third of their time learning the practical side of gas fitting in training workshops both at the Technical College and at the Southern Gas Board's works.

Classroom study will include the usual gas, technical and allied subjects, but in addition will cover English, science, and general subjects — local government, P.A.Y.E., economics and even physical education will all come under the latter heading.

'My concern here,' says Mr. A. N. Nobbs, Vice-Principal and Head of the Department of Building, 'is not only to give apprentices the best possible gas fitting training, but to broaden their education.'

PEAT-GAS TOO DEAR

Experiments being carried out by Bord na Mona (the Irish peat development corporation) to produce town gas from peat are not likely to be carried much further, according to a report issued by the engineers and scientists on the project.

The experiments, which started about two years ago, were part of the Board's plan to pipe gas from the midland bogs to Dublin City. The plant required to do this has proved, however, to be too expensive.

W.G.F. film show

About 94 members of the **Scarborough** branch of the Women's Gas Federation saw a film show given by Mr. J. Bainbridge of the North Eastern Gas Board at their September meeting.

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FOR sale—60-70 gross New Brav Industrial Gas Jets. Type 235, Box No. 365, *Gas Journal*, 11 Bolt Court, Fleet Street, E.C.4.

APPOINTMENTS VACANT

EASTERN GAS BOARD

(CAMBRIDGE DIVISION)

TECHNICAL ASSISTANT

APPLICATIONS are invited from suitably qualified persons for the position of Technical Assistant in the Cambridge Gas Works. The salary for the post will be within Grade APT. 8 of the National Joint Council for Gas Staffs Provincial A, the commencing step being dependent on the qualifications and experience of the candidate.

The successful candidate will be required to pass a Medical Examination and unless already subject to a Pension Scheme, by virtue of the Gas Pension Rights Regulations 1950, will be required, if eligible, to join the Eastern Gas Board Staff Pension Scheme within six months from taking up the appointment.

Applications giving full details of age, training, qualifications and experience together with the names of two referees should be sent to the General Manager, Eastern Gas Board (Cambridge Division), 52, Sidney Street, Cambridge, not later than September 30, 1959.

EAST MIDLANDS GAS BOARD

ASSISTANT SUPERANNUATION OFFICER

APPLICATIONS are invited for the above appoint-ment at Board Headquarters, Leicester.

Candidates should have a good working knowledge of the administration of large scale pension schemes, preferably within nationalised industries or local authorities.

The commencing salary will be within the range £773-£927 according to qualifications and experience, and there will be scope for promotion to a higher grade (rising to £1,002) for a man who proves his ability to assume greater responsibilities.

The post is pensionable and the successful candidate will be required to pass a medical examination.

Applications, giving details of age, education, experience and qualifications, together with the names and addresses of two referees, should be addressed to reach the undersigned not later than October 7, 1959.

A. GWYNNE DAVIES,
Secretary.

Beverley House,
University Road,
Leicester.

September 16, 1959.

EAST MIDLANDS GAS BOARD

INTERNAL AUDITOR
LEICESTER & NORTHANTS DIVISION

APPLICATIONS are invited for the above appoint-ment from qualified accountants, preferably having practical experience of internal audit procedure. The post is based on Leicester and the duties will involve some travelling within the Division.

The salary scale is Grade A.P.T. 10 of the National Salary Scales (£902/£1,002 per annum), commencing salary being determined by qualifications and experience.

The post is pensionable and the successful applicant will be required to pass a medical examination.

Applications stating age, experience, qualifications, present appointment and salary, together with the names of two referees, should be sent to the undersigned, to be received not later than October 12, 1959.

A. GWYNNE DAVIES,
Secretary.

Beverley House,
University Road,
Leicester.

September 16, 1959.

SOUTHERN GAS BOARD

FIRST Class Gas Fitter required in the Aylesbury district of the Oxford Region.

Applicants should have had training and experience in Gas Fitting work and must have passed the City and Guilds Final Grade examination in Gas Fitting. The current rate of pay is 4s. 11d. per hour and accommodation is available on a service tenancy basis.

Applications stating age, education, qualifications and experience should reach the undersigned before October 8, 1959.

Personnel Manager,
Southern Gas Board,
164 Above Bar,
Southampton.

September 11, 1959.

NEW ZEALAND—DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. GAS EXAMINER—DOMINION LABORATORY —WELLINGTON OR CHRISTCHURCH. VACANCY NUMBER 2021

APPLICATIONS are invited from graduates or persons with other suitable qualifications for the position of Gas Examiner under the New Zealand Gas Regulations. Duties involve regular visits to Gas Works and considerable travelling.

Salary up to £1,245 per annum according to qualifications and experience.

Sea passages to New Zealand for successful applicants and their families, if any, will be arranged and paid for by the Department. In addition a general allowance towards the cost of tansporting light personal effects will be given.

Enquiries mentioning this publication and quoting reference number B11/21/21 should be addressed to The High Commissioner for New Zealand, 415 Strand, London, W.C.2.

Completed applications to be lodged in London not later than November 13, 1959.

WEST MIDLANDS GAS BOARD
BIRMINGHAM AND DISTRICT DIVISION

VACANCY FOR
ASSISTANT CHEMIST

CANDIDATES should possess the Ordinary National Certificate in Chemistry, and must have had experience of routine testing and control of water softening plant, etc.

The person appointed will be required to work initially at Saltley Gas Works.

The salary for the appointment, which is pensionable and subject to medical examination, will be within APT Grade 6 (£664-744 per annum) of the National Salary Scales for Gas Staffs.

Applications, stating age, experience and qualifications, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Edmund Street, Birmingham, 3, **to reach him not later than October 1st, 1959.**

J. SWAN,
Secretary to the Board

WEST MIDLANDS GAS BOARD
WOLVERHAMPTON AND DISTRICT DIVISION

VACANCY FOR
HOME SERVICE ADVISER

CANDIDATES should have experience in domestic science and hold an appropriate diploma. They should be capable of working independently, of conducting cookery and laundry demonstrations using gas appliances, and also have had experience in Home Service work.

The salary for the appointment, which is pensionable and subject to medical examination, will be within Special Grade 5 (£495-£603 per annum, rising to £625 per annum) of the National Salary Scales for Gas Staffs.

Applications, stating age, education, qualifications and experience, together with the names of two referees, should be addressed to Mr. S. Jones, Divisional General Manager, West Midlands Gas Board, Kensington House, Bath Street, Dudley, **to reach him not later than October 2, 1959.**

J. SWAN,
Secretary to the Board.

NORTHERN GAS BOARD
DARLINGTON DIVISION

SENIOR TECHNICAL ASSISTANT—DARLINGTON UNIT

APPLICATIONS are invited for the position of SENIOR TECHNICAL ASSISTANT at the Darlington Unit.

Applicants should be qualified to undertake full responsibility, under the Works Manager, for supervision of technical staff, control of a G.W. Vertical Retort Installation, Modern C.W.G. plants and ancillary equipment. Corporate Membership of the Institution of Gas Engineers or an equivalent qualification is essential.

The salary will be within Grade A.P.T. 10, Provincial 'A' (£902 to £1,002 per annum) of the National Salary Scales, initial placing according to experience and qualifications.

The successful applicant will be required to pass a medical examination and join the Board's Pension Scheme.

Applications, stating age, experience and qualifications together with the names of two persons to whom reference can be made should be received by Mr. Charles Hindle, Sub-Divisional Manager, Gas Offices, John Street, Darlington, not later than October 12, 1959.

F. WILSON,
Divisional General Manager.

NORTH WESTERN GAS BOARD
MANCHESTER GROUP—DISTRIBUTION DEPT.

ASSISTANT DISTRICT DISTRIBUTION ENGINEER

APPLICATIONS are invited from suitably qualified persons for the above pensionable appointment at a salary within Grade A.P.T. 12 (£1,006/£1,131).

Applicants should possess the Higher Grade Certificate (Supply) of the Institution of Gas Engineers or an equivalent qualification and should be experienced in all branches of gas distribution at both low and high pressures. Sound training and experience in the planning, estimating and provision of distribution systems is essential.

Applications, stating age, qualifications and experience, together with the names of two referees and quoting vacancy No. 287, should reach the General Manager, Manchester Group, North Western Gas Board, Town Hall, Manchester, 2, within 14 days.